

Dear FCC,

Thank you for the opportunity to provide comments on NBP Public Notice # 4, in advance of the Broadband Accessibility for People with Disabilities Workshop II, GN Docket Nos. 09-47, 09-51, 09-137.

As requested in the request for comments of September 18, 2009, I am structuring my comments in the order of the questions in that document.

**** Comments regarding "1. Accessibility and Affordability Barriers Faced by People with Disabilities":**

The single biggest barrier to Broadband Internet use by people with significant disabilities is affordability, followed by training and support. Among those with significant vision and motor impairments where AT products like screen readers, screen magnifiers and head tracking systems are needed to provide access, the cost of acquiring such AT is a huge barrier. Significant training is often necessary before these tools can be used effectively for tasks such as web browsing, exchanging e-mail, and participating in eGovernment. Many of these systems – particularly the after-market solutions that run on Windows – need a significant level of ongoing support and maintenance, lest they system become misconfigured and unusable.

There are several options to consider in addressing the issue of affordability of the system used to connect to the Internet:

1. Subsidize the cost of these 3rd-party AT solutions, including potentially subsidizing the cost of the computer / Internet terminal itself. This approach is taken in several European countries, including notably The Netherlands, where elderly disabled individuals are supplied with accessible computers.
2. Provide systems that have built-in accessibility / AT solutions (such as Macintosh with the built in VoiceOver screen reader), which may be significantly less expensive than a Windows system with 3rd-party AT.
3. Provide existing open source accessibility solutions such as those found in OpenSolaris, Ubuntu Linux or Fedora Linux (among others). Free and open source operating systems such as the three mentioned include a variety of accessibility / AT solutions such as the built-in Orca screen reader, which when combined with very inexpensive hardware is an even

less expensive option that #1 or #2 above.

4. Potentially in partnership with telecommunications firms, provide thin-client / network computers that have accessibility / AT solutions included with them. Such thin-client / network computers might be included with the broadband service itself, or provisioned by a separate party from the main broadband provider. A solution such as the Sun Ray thin client combined with OpenSolaris is an example of this option.

In several of the options described above, the subsidy might be an outright purchase for these individuals, or a low-interest loan for the systems. For providing underlying hardware, a computer recycling program might be an option (e.g. recycling old PCs and installing an open source solution on them).

Another barrier to be addressed is training. In the cases where 3rd-party AT is purchased on behalf of people with disabilities, a certain amount of training could be part of the purchase price. A number of these 3rd party AT products include a significant amount of training materials and a certainly duration of telephone technical support. In other cases (such as Macintosh, open source, and thin-client) – and perhaps even for 3rd-party AT – it will be important to have training services available throughout the country. These might include existing commercial training organizations, existing Tech Act centers, and particularly in the case of open source solutions user self-help groups.

Beyond training, on-going maintenance and support is critical. Particularly for people with motor impairments, but even generally, an assistant or technical expert may be needed to troubleshoot the system. Such troubleshooting may be more frequently needed with Windows systems running 3rd-party AT, but any system can have problems that require a technician to help solve it. Perhaps the best option for dealing with this barrier is the thin-client / network computer option, as in that case the majority of the problems that might occur can be solved remotely without the need to ever touch the physical machine in the user's home.

Another concern that should be considered is what happens to these systems as technology evolves. How long will the system remain “up to date”? What will it cost to bring a 2 or 3 (or 5) year old system up to

date to use whatever the new web or eGovernment features have come on the scene? Again here the cost issue includes whether to update 3rd-party AT or simply to purchase an update to the operating system. Open source and thin-client / network computer options will be the best way of addressing this update cost barrier.

**** Comments regarding "2. Technological Barriers and Solutions, subsection (a)":**

"Staying ahead of technology" and avoiding "retrofitting technology" is absolutely critical, and the technical recommendations contained within Telecommunications and Electronic and Information Technology Advisory Committee report (see <http://www.access-board.gov/sec508/refresh/report/>) are specifically crafted to address that critical issue. Particularly key to avoiding "retrofitting technology" are the provisions relating to AT-IT interoperability, and the Accessibility Services that mainstream technology must provide (please see provisions 3-U, 3-V, and 3-VV). A related challenge to "staying ahead" and "avoiding retrofitting" is the need to ensure that assistive technologies "stay abreast" of new technology developments. This is a particular an issue with the AT that are being used by people today – users often don't have the latest versions of AT which are needed to access the latest versions of operating systems and applications. This notion of keeping AT up to date is partly addressed in the draft 3-VV provision, but it is not enough to simply state that AT should utilize the latest in Accessibility Services (3-U and 3-V) exposed by applications; it is necessary to ensure that such AT be developed and is in the homes of broadband users with disabilities. Requiring that new technology be compatible with old AT will be necessarily stifling of technology developments (and may further hinder America's ability to compete worldwide). Rather, what is needed is funding to develop either built-in accessibility features or funding for add-on assistive technology that "stays abreast" with new technology. Such funding might go to existing 3rd-party/commercial AT vendors, or to fund open source accessibility initiatives.

**** Comments regarding "2. Technological Barriers and Solutions,**

subsection (b)":

Similar to the challenge faced in (a) above, the challenge of interoperability was explicitly addressed in the Telecommunications and Electronic and Information Technology Advisory Committee report – again, explicitly in provisions 3-U, 3-V, and 3-VV. These recommended provisions should be fully embraced by the FCC as part of the Section 255 refresh.

**** Comments regarding "3. Furthering National Purposes and People with Disabilities, subsection (b)":**

There are tremendous potential opportunities for on-line education for people with disabilities, and a National Broadband Plan should explicitly recognize that potential and seek to realize it. From the regulatory/policy side, there are several provisions in the Telecommunications and Electronic and Information Technology Advisory Committee report that are applicable – specifically Section 5 relating to "Audio and/or Video Content", and also Section 7 "Additional Requirements for Authoring Tools", which is applicable specifically to things like Bookshare because the document structure and metadata that is so important for accessibility for things like audio books needs to be put there from within an Authoring Tool.

**** Comments regarding "5. Policy Solutions and Recommendations Panel subsection (a)":**

Section 508 of the Federal Rehabilitation Act (and also Section 255 of the Telecom Act) have been very successful in bringing about significant technology change for the better for people with disabilities. In response to 508, IT companies have made very significant investments in accessibility – most notably resulting in:

- the platform accessibility APIs on Windows (MSAA & UI Automation & IAccessible2), Macintosh, UNIX, Java, the iPhone, Blackberry, and just last week Android
- built-in accessibility technologies such as the VoiceOver screen reading system of Macintosh and iPhone, the magnification functionality of Macintosh and iPhone, the Orca screen reading functionality of UNIX systems such as OpenSolaris and Fedora and Ubuntu, the GNOME On-screen

Keyboard of UNIX systems such as OpenSolaris..., the Dasher alternate text entry system of UNIX systems such as OpenSolaris...

- industry leadership in accessibility standards efforts such as the OASIS OpenDocument Accessibility Subcommittee to review and address accessibility issues in ODF (ISO/IEC 26300:2006) and similar efforts for Adobe PDF/A, and the emerging WAI ARIA standard (which defines the set of "Accessibility Services" for web applications)
- support for the emerging/new accessibility standards in applications – such as Firefox & IE's support for WAI ARIA, and StarOffice/OpenOffice.org's support for the accessibility APIs of UNIX and Macintosh

Rather than introducing new regulatory efforts at this point, we should finish the Section 508/255 refresh effort – perhaps accelerating that refresh – and bring to the scene the new set of recommendations that explicitly address "staying ahead of technology". Given the tremendous effort that went into that refresh process – and the incredibly broad set of thoughtful voices from around the world that provide input into a report whose provisions overwhelming achieved consensus – it would be a mistake to start a new regulatory process before first applying the results of this last one.

**** Comments regarding "5. Policy Solutions and Recommendations Panel subsection (b)":**

Government has a key role to play in funding further research into accessibility solutions. The first two access solutions to the graphical desktop – the inLARGE screen magnifier for Macintosh released in 1987 and the outSPOKEN screen reader for Macintosh released in 1989 – came to market through a National Eye Institute grant. The techniques embodied in these two products from two decades ago remain core parts of virtually all screen magnifiers and most screen readers on the market today.

Similar research funding is critically needed to address the necessary new access techniques for users served from these two-decades-old techniques (to help they "stay abreast" of "new technology"), and further is particularly needed for areas that existing access solutions have little to offer such as intellectual disabilities. Research should include an explicit focus on efficiency and productivity of people with

disabilities in doing tasks with information and communication technology. A research model worth studying is the European Commission's FP7 program, and specifically the AEGIS project (<http://www.aegis-project.eu>) which is further developing open source accessibility options for multiple platforms.

Pursuant to the role of open standards in accessibility, the model of the OASIS OpenDocument Format Accessibility Subcommittee is worth emulating -> where open standards efforts for mainstream technology explicitly include a group of accessibility experts and people with disabilities who review the standard for accessibility issues and impact. Published in 2007, Dr. John Gill of RNIB published a report on "Involving People with Disabilities in the Standardisation Process" that is applicable here (see http://web.archive.org/web/20080229131726/http://www.tiresias.org/publications/disabilities_standardi/sation/index.htm).

Thank you for the opportunity to provide comments on this important issue.

Regards,

Peter Korn
Technical Manager, AEGIS project, and
Accessibility Architect & Principal Engineer
Sun Microsystems, Inc.

--Boundary_(ID_IRcLJ8ScrFvR5BeSj3EMBQ)
Content-type: text/html; charset=windows-1252
Content-transfer-encoding: 8BIT

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
  <meta content="text/html; charset=windows-1252"
http-equiv="Content-Type">
</head>
<body bgcolor="#ffffff" text="#000000">
```

<div class="moz-text-html" lang="x-western">
<div class="moz-text-flowed"
style="font-family: -moz-fixed; font-size: 13px;" lang="x-western">ECFS
- Email Filing

<PROCEEDING> 09-47

<DATE> 10/06/2009

<NAME> Peter Korn

<ADDRESS1> 17 Network Circle

<ADDRESS2> Mail Stop MPK17-101

<CITY> Menlo Park

<STATE> CA

<ZIP> 94025

<DOCUMENT-TYPE>CO

<PHONE-NUMBER> 510-550-7396

<DESCRIPTION> Email-Comment

<CONTACT-EMAIL> <a class="moz-txt-link-abbreviated"
href="mailto:peter.korn@sun.com">peter.korn@sun.com

<TEXT>

Dear FCC,

Thank you for the opportunity to provide comments on NBP Public Notice
4, in advance of the Broadband Accessibility for People with
Disabilities Workshop II, GN Docket Nos. 09-47, 09-51, 09-137.

As requested in the request for comments of September 18, 2009, I am

structuring my comments in the order of the questions in that document.

**** Comments regarding "1. Accessibility and Affordability Barriers Faced by People with Disabilities":**

The single biggest barrier to Broadband Internet use by people with significant disabilities is affordability, followed by training and support. Among those with significant vision and motor impairments where AT products like screen readers, screen magnifiers and head tracking systems are needed to provide access, the cost of acquiring such AT is a huge barrier. Significant training is often necessary before these tools can be used effectively for tasks such as web browsing, exchanging e-mail, and participating in eGovernment. Many of these systems – particularly the after-market solutions that run on Windows – need a significant level of ongoing support and maintenance, lest they system become misconfigured and unusable.

There are several options to consider in addressing the issue of affordability of the system used to connect to the Internet:

1. Subsidize the cost of these 3rd-party AT solutions, including potentially subsidizing the cost of the computer / Internet terminal itself. This approach is taken in several European countries, including notably The Netherlands, where elderly disabled individuals are supplied with accessible computers. 2. Provide systems that have built-in accessibility / AT solutions (such as Macintosh with the built in VoiceOver screen reader), which may be significantly less expensive than a Windows system with 3rd-party AT.

3. Provide existing open source accessibility solutions such as those found in OpenSolaris, Ubuntu Linux or Fedora Linux (among others). Free and open source operating systems such as the three mentioned include a variety of accessibility / AT solutions such as the built-in Orca screen reader, which when combined with very inexpensive hardware is an even less expensive option than #1 or #2 above.

4. Potentially in partnership with telecommunications firms, provide thin-client / network computers that have accessibility / AT solutions included with them. Such thin-client / network computers might be included with the broadband service itself, or provisioned by a separate party from the main broadband provider. A solution such as the Sun Ray thin client combined with OpenSolaris is an example of this option.

In several of the options described above, the subsidy might be an outright purchase for these individuals, or a low-interest loan for the systems. For providing underlying hardware, a computer recycling program might be an option (e.g. recycling old PCs and installing an open source solution on them).

Another b